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University of Massachusetts Medical Center



'The act of discovery...

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as rewarding



as ever.'

Annual Report 1994

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FEB 27 1995

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he forces that are driving major change in the country's healthcare system continue to have an impact on the Medical Center and its network of affiliates.

Early in the year, a milestone event directly attributable to these forces of change was my meeting with President Clinton in Boston. Called by the President to seek support from the academic medical community for his healthcare plan, the meeting included UMass Hospital Director Gail Frieswick, as well as the deans of Boston's three medical schools and the CEOs of its major teaching hospitals.

It is very clear that with or without healthcare reform at the federal level, reform in the industry is moving along rapidly. I am pleased to report that a number of positive and significant changes have taken place at UMMC.

During 1994, we completed our strategic planning and restructuring of clinical activities. The resulting integrated clinical system will function under a new governance structure, the Clinical Management Board. The CMB replaces the community-based Hospital Management Board, which had overseen activities of the hospital since its opening in 1976. We are grateful for the years of support and commitment from that board's members, and look forward to working with the new board.

Another result of our clinical planning process is the commitment to cut hospital costs by approximately \$42 million over four years, beginning with the \$12 million reduction already effected for FY 95.

Reorganization has encompassed the Medical Center's education and research components, as well as its clinical service, and I named three individuals to newly created positions responsible for each of these areas. They are Andrew Cohen, MD, vice dean for medical education; Arthur Russo, MD, deputy chancellor for clinical affairs; and Edward Bresnick, PhD, vice chancellor for research. We look forward to the Medical Center's first full year with this new structure providing governance of the three linchpins of our mission.

Reflecting a new focus on the research enterprise at UMMC, under Dr. Bresnick's able leadership, this annual report highlights research activities and the development of initiatives that will generate new sources of revenue in return for the "intellectual property" of our faculty. Although our scientists have maintained significantly high support in grant funds — and even increased the total of funding this past year — the reality of shrinking resources at the federal level forces us to become more creative and entrepreneurial in seeking new sources of revenue to support our scientific endeavors.

As always, I welcome your comments about the activities covered on the following pages.



Aaron Lazare

AARON LAZARE, MD
Chancellor and Dean

Acts of Discovery

"Brutal." "Wonderful." "Agonizing." "Exhilarating." All are adjectives that scientists use to describe the same activity — their research. Indeed, they are words to live by, for science — no 9-to-5 job — is a kind of calling.

There's no other career like it, declares Michael P. Czech, PhD, who directs UMMC's Program in Molecular Medicine: "Despite the powerful technological tools we have developed for probing increasingly difficult questions, the act of discovery in which scientists engage hasn't changed. Practicing science remains as exasperating, heartwrenching, unsettling and, therefore, as rewarding as ever."

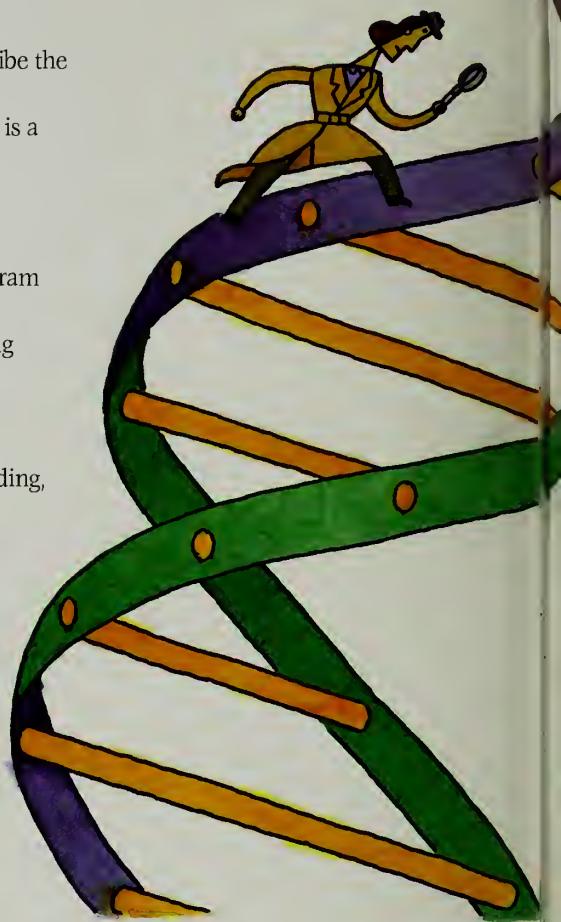
From Puzzle to Petri Dish

But even before reaching that laboratory phase of research, a basic scientist first must formulate a problem. He or she then spends days, perhaps weeks, reviewing the most current scientific literature and communicating with other scientists to determine what studies have been done on that problem.

The scientist then switches gears to locate funds that will support the project — yet another search, and one that may require months to write the necessary grant proposals. For example, one researcher in UMMC's Cancer Center had to submit 25 copies of a 1,000-page grant to the National Institutes of Health (NIH), just to describe one protocol.

Once an experiment is up and running, the scientist never can predict, with absolute certainty, just how long that experiment will take or what the results will be. As Aldo Rossini, MD, professor of medicine and director of UMMC's Diabetes Division, puts it, "You can't force answers in science. The facts in an experiment speak for themselves."

Rossini, who in 1994 earned NIH funding for the 17th consecutive year, points out that "you can't prejudge, and you can't forget that even the simplest living organisms are complex." *(Continued on page 5)*





Faces of Research: A Sleuth in Gene Therapy

A stint as a research assistant in her genetics professor's lab steered then-undergraduate Ellie Kittler onto her career path. "That's when I discovered the really cool stuff in science wasn't in the textbooks, but in the laboratory," she says. "It takes a long time for basic science discoveries to make their way into journals and textbooks. I wanted to be where all the action is."

And she'll see plenty of it in the Cancer Center's new Gene Therapy Laboratory, which she designed. Completed at year's end, it's the first such lab ever designed for clinical use and is a vital component of the new UMMC program in gene therapy. The program already has two protocols approved by the government for performing gene therapy trials on human subjects.

The first gene therapy protocols performed at UMMC will involve inserting a neomycin-resistance gene — a harmless "marker" — into patients with chronic myelocytic leukemia and multiple myeloma. By taking the patients' blood over the next two years and monitoring it, Cancer Center researchers will be able to follow the marker genes to glean information about the nature of the cancers, where and how relapses occur, and which chemotherapy agents are the most effective in treatment.

Eventually, Kittler hopes to see the UMMC group's gene therapy research with the multiple drug resistance gene (MDR-1) approved for protocols with

humans. All marrow cells naturally have the MDR gene which, when turned on, produces a protein that escorts toxic chemicals — like chemotherapeutic agents — right out of the cell. But this gene is turned off when stem cells mature into white blood cells, so only stem cells are protected. In clinical trials with MDR, the team hopes to insert the gene into the cells of cancer patients, so that healthy cells will be more tolerant of chemotherapy.

"Part of our intent in all of this is technology transfer," Kittler says, "so that our protocols for MDR insertion and other gene therapy treatments can be developed. This is the kind of translational research that really matters: as basic scientists, we're collaborating with clinicians to look at what's killing people, like cancer and AIDS, and then working on breakthroughs that are practical as well as scientifically intriguing."



"I discovered the really cool stuff in science wasn't in the textbooks, but in the laboratory."

ELLEN L.W. KITTLER, PHD

Assistant Professor of Medicine and Director,
Cancer Center Gene Therapy Laboratory

Faces of Research: Cultivating Nature's Drugs

Several years ago, John Fray awoke at 3 a.m. and had an epiphany about the way he had been performing his research.

"Always before, I had pictured myself sitting on the membrane of a cell and looking inside it to see how the cell released renin," he says. "This time, I sat on the cell membrane and looked outside instead. I saw the effects of renin disorders in a way that I never had before. I pictured high blood pressure, diabetes and scleroderma, a skin disease that causes white people to develop large patches of black skin. I realized then that we could form an entire company based on the biotechnology of renin."

Fray's research for the past 25 years has centered on understanding disorders having to do with renin, an enzyme produced by the kidney, which Fray has determined is involved in more than 20 clinical disorders. In 1994, his idea to form a company took shape as Jamaika Biotek, a Massachusetts-incorporated biotechnology company headquartered in Jamaica. Fray states, "The company's research focus initially will be on extracting natural products from herbs to make drugs to treat clinical disorders."

For example, a potential product is a drug to be used in place of costly insulin for patients with Jamaica-type diabetes, another of Fray's research areas. This disease falls somewhere between juvenile diabetes, which causes individuals to be insulin-dependent, and adult diabetes, which can largely be controlled through diet and exercise. Fray estimates that nearly 20 percent of all Jamaicans have diabetes.

"Most pharmaceutical companies make money by producing receptor drugs," explains Fray, a native of Jamaica. "Most of these receptor drugs are molecules, and insulin is the champion of those molecules, since last year the insulin market was \$638 million. One of my goals is to produce an insulin substitute for people who can't afford to buy insulin — like Jamaicans with Jamaica-type diabetes. Many of them would have to spend a year's salary to buy the insulin they need."

More than anything, Fray hopes that the profits of Jamaika Biotek, and the basic science conducted there, will impact the science education of Jamaican youths by providing money and educational opportunities to students. "My experience is that nobody appreciates the wonders of science more than a child," he says. "In 20 years' time, today's youths will be in a position to play leadership roles. It's important to cultivate in them not only wonder, but values and a direction. This can begin with a science education that gives young people a way of knowing themselves and the world."



"The company's research focus initially will be on extracting natural products from herbs to make drugs to treat clinical disorders."

JOHN C. FRAY, PHD
Professor of Physiology

What your gift to the UMass Medical Center can do....

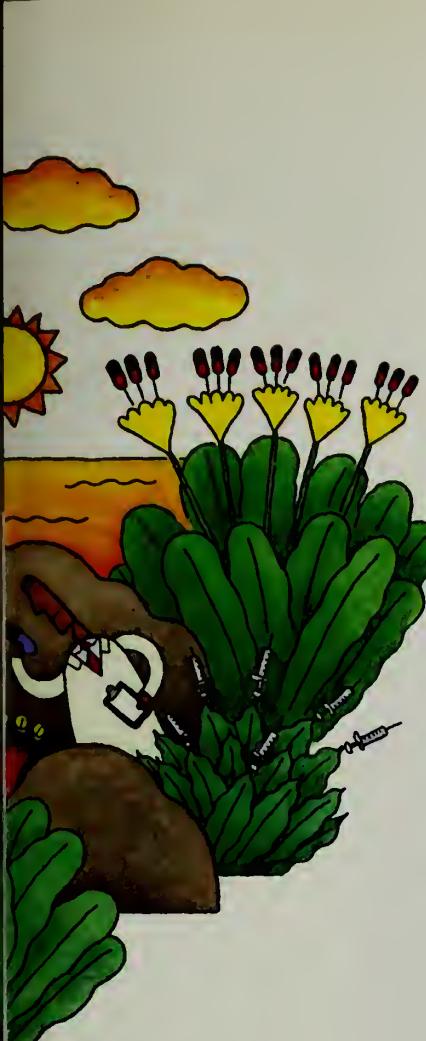
Here are some examples of how your gift to the annual fund can make a difference for the patients who depend on UMass Medical Center.

1 gift of \$50 can buy inoculations for an economically disadvantaged toddler.

10 gifts of \$50 each can provide a bone marrow aspiration biopsy and interpretation for a cancer patient.

100 gifts of \$50 each can transport a critically injured person by Life Flight helicopter.

One of five campuses of the University of Massachusetts, the Medical Center in Worcester consists of a medical school, teaching hospital, graduate schools of biomedical sciences and nursing, a program in molecular medicine and a cancer center. The mission of the University of Massachusetts Medical Center is to serve the people of the commonwealth through excellence in healthcare education, service and research.



If an experiment takes longer than expected, however, costs rise accordingly. Other projects may overlap, making scientists scramble for both time and money. And, when all is said and done, the experiment may not work out as hoped.

Papers written on the research project, then submitted to academic journals, are subject to rejection as well. No wonder people ask why anyone — given the long hours, relatively low pay, and hours of potential frustration — would opt for a career in basic science research. "Because there is no other work as exhilarating," answers Dr. Czech, who recently was named principal investigator for a \$1.5 million grant from the Lucille P. Markey Charitable Trust (*see page 15*).

For most basic scientists, the NIH puts bread and butter on the table, and pipettes and petri dishes on the lab bench. The total amount of NIH funding available for research amounted to less than \$9 billion in fiscal 1993, just 2 percent of the country's total healthcare costs, according to Sumner H. Burstein, PhD, a professor of biochemistry who has spent the past 25 years studying the biochemistry and pharmacology of marijuana.

One result of his work is a 1994 licensing agreement with Atlantic Pharmaceuticals, to develop a synthetic derivative of marijuana into a drug that could serve as a safe alternative to aspirin or ibuprofen in providing anti-inflammatory relief to millions of people.

"That [NIH's] \$9 billion is not really a lot of money," says Burstein, "not when you consider the number of highly qualified researchers applying for grants and the escalating costs of operating laboratories."

And that's why scientists today must approach the search for funding as almost a game, says Peter Quesenberry, MD, director of the UMass Cancer Center. "Scientists must keep knocking at the door to be successful," he advises. "It used to be that 40 percent of all NIH grants were funded, but the process of applying for them has gotten tougher and tougher. Today, many projects judged to be among the top 15 percent aren't funded because the money just isn't there. (*Continued on page 6*)

"Grants submitted today must be absolutely flawless to be considered, and even that might not be good enough," Quesenberry asserts. "If you're in the business of submitting grants, you've got to assume a certain number of rejections. It's a process that takes ego, strength and some degree of confidence."

From Lab to Real Life

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or Edward Bresnick, PhD, UMMC's new vice chancellor for research, there's no other career worth considering: "There are very few areas where you get paid to do what you love to do. If you enjoy the business of discovery, science is magical!"

Bresnick's position as vice chancellor for research was one of two created in 1994 to lay the foundation for future growth at the Medical Center and to enhance the economic development mission of the University and the commonwealth.

As an academic medical center with a mission to produce physicians who will provide primary care, and as the only tertiary care hospital in the region, UMass has long been recognized for its excellence in education and clinical care. Increasingly, the institution is also gaining recognition for its innovative basic research programs. (*See pages 14-15 for recent major grants.*) In 1994 alone, UMMC scientists garnered \$40 million in NIH funding and another \$15 million in funding from private foundations and industry.

One reason UMass researchers continue to be successful in winning funds from both government and private sources is precisely because of the institution's status as an academic medical center. In this setting, basic scientists collaborate with clinicians to bring research innovations to the bedside faster. Scientists are counting on this "translational research" — as Dr. Quesenberry calls it — to put UMass at the forefront and to bring some of the most promising clinical treatments out of the laboratory and into the lives of patients as soon as possible.

Vice Chancellor Bresnick will be involved in long-range planning for scientific program development at the Medical Center, and he will spearhead the continued advancement of basic and clinical research programs as he develops collaborative projects between UMMC investigators and the private sector. (*Continued on page 9*)



Faces of Research: Improving the Viewfinder

What is the fundamental event that causes muscle cells to contract and control blood pressure, and how in the world can astronomers and physicists help us to see that event better?

"When muscles contract, molecules within cells change their distribution at speeds as high as every 1/1000th of a second," reports Fred Fay. "How can we see those rapid changes take place? Well, we went snooping around to see who, out there, is solving similar problems."

Astronomers, that's who. In trying to look through a telescope "from the ground up to see what's flying by and what's coming in," Fay

explains, "astronomers look at images distorted by the atmosphere, much like looking at something through wax paper. They take the distortions out of those images with the help of adaptive optics. In the world of biology, we'd like to have a camera that can give us information about the distribution of molecules involved in the rapid signalling in cells — something that is clearer than a blur of molecules in motion."

If anyone can make such a camera, Fay's group can. They have already successfully pioneered the technology to make a digital imaging microscope. That system, **CELLscan**, is currently sold all over the world by **Scanalytics**, a division of **CSP Inc.**, a Massachusetts company. **CELLscan** combines a highly sensitive camera with a modern light microscope

and a powerful computer. The system uses mathematical models to reconstruct and resolve 3-dimensional images that are not possible to see with conventional microscopes.

In a separate technology transfer arrangement with **Scanalytics**, Fay and his colleagues also are working on a much faster microscope — a hot rod version that will allow scientists to see events happen inside cells during "real time." It will be an enormous improvement over the current microscope, which takes four to eight hours to produce images.

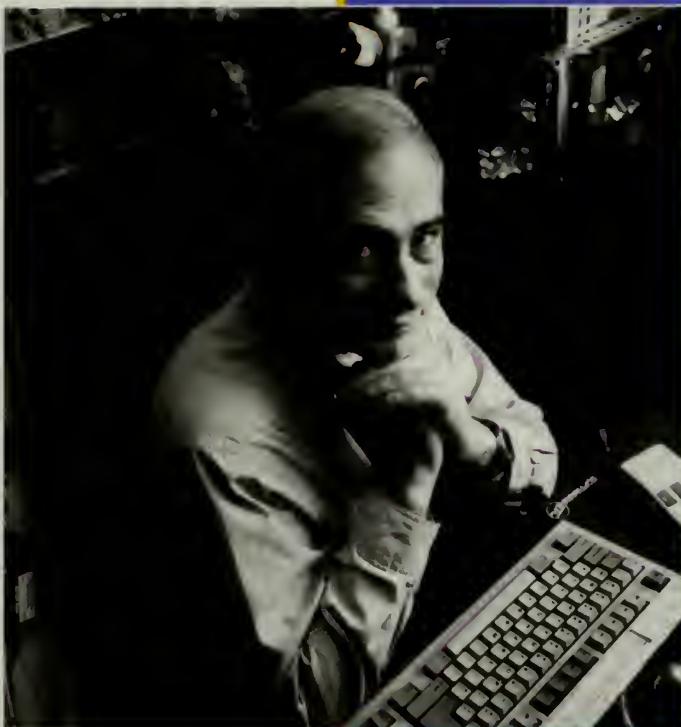
Fay and physicist Richard A. Tuft, PhD, a research associate professor of physiology, are traveling the country and talking with astronomers and physicists about the project. Their mission? To explore how technology used for adaptive optics — the use of mirrors to compensate or correct for the distortion of the atmosphere — can also be used to see more clearly how molecules are organized inside cells. For example, Tuft is currently at work on a microscope that will provide beams of four different light wavelengths that will continually cycle through the cell at very high speeds.

"Everything we do is like peeling an onion," says Tuft, "with every layer of problem-solving harder and harder to get through. Our lab is a complex welding of technology and biology."



"We'd like to have a camera that can give us something clearer than a blur of molecules in motion."

FREDRIC S. FAY, PHD
Professor of Physiology,
Director of the Division of Biomedical Imaging



Faces of Research: All the Angles on AIDS

John Sullivan's approach to researching the AIDS virus is to leave no stone unturned: "All of our work is intertwined. Our laboratory group studies AIDS from every aspect — we're researching the pathogenesis of the disease, drug development and vaccines."

Through a novel series of experiments, for example, Mohan Somasundaran, PhD, assistant professor of pediatrics, has demonstrated that viral RNA from the AIDS virus most likely kills the body's CD4 T lymphocyte cells — the immune system's most important warriors against disease — by entering and destroying their mitochondria. Performed in collaboration with Robert Singer, PhD, in the department of cell biology, this research was published in the *Journal of Cell Biology* in 1994. Drs. Sullivan and Somasundaran are working on the use of a class of drugs that appear to protect mitochondria from viral infection. Ultimately, this strategy could lead to new avenues for developing a drug to treat AIDS successfully.

The lab also is testing the drug Nevirapine, which was developed at UMass in conjunction with Boehringer Ingelheim Pharmaceutical. With the drugs AZT and ddi, Nevirapine is being given to a small group of infants newly diagnosed with HIV infection. These studies led by Sullivan team member Katherine Luzuriaga, MD, are being carried out at family health centers in Lawrence and Lowell, Bay State Medical Center in Springfield and the University of Connecticut.

In addition, Sullivan and Thomas Greenough, MD, are collaborating with Doreen Brettler, MD, at the Medical Center of Central Massachusetts to follow the progress of 150 area adults with hemophilia, who were infected with HIV by blood transfusions during 1980-82. Many of them have developed full-blown AIDS, but seven have remained healthy over the past dozen years. "The big question is why some people who contract AIDS suffer from a rapid destruction of the immune system, while others do not," Dr. Sullivan explains. "Thus far, we have found that in one of these long-term survivors, the virus is missing the Nef gene."

This finding ties in with results of a New England Primate Center study of simian AIDS, says Sullivan: "Monkeys infected with an SIV virus that's missing the Nef gene don't get sick. And if monkeys are infected with the benign SIV virus — the virus without the Nef gene — and then injected with pathogenic SIV, they don't develop the disease."

Sullivan's lab also is working with Therion Biologics, an applied biotechnology company, to develop and test HIV vaccines in clinical trials. "By approaching the study of AIDS in so many different ways, we're hoping to come up with affordable, effective prevention and treatment strategies which may be applied in the developing world," he asserts.



"Our laboratory group studies AIDS from every aspect —

we're researching the pathogenesis of the disease, drug development and vaccines."

JOHN L. SULLIVAN, MD
Professor and Vice Chair of Pediatrics,
Professor of Molecular Genetics & Microbiology,
Director of the Division
of Immunology/Rheumatology



One example of such ventures is a research contract under which a drug company pays UMMC \$100,000 annually in return for faculty expertise in testing some of its drugs. Kristin Carlson, PhD, associate professor of pharmacology, is studying the psychopharmacological effects of isomers of drugs.

Isomers exist in two forms that are mirror images, like right and left hands. Such drugs usually are sold as mixtures of the two forms, but researchers think that more specific intended effects — with fewer side effects — might be realized from a single form.

The new vice chancellor also will be responsible for overseeing and developing scientific facilities, including high technology core facilities currently being completed or planned. One immediate example is UMMC's Neuropsychiatric Research Institute, for which plans were announced late in the fall by Lt. Gov. Paul Cellucci (*see page 14*).

Bresnick calls UMass "a high quality institution with top investigators — I'd say it's the best kept secret in Massachusetts! My job here is to act as catalyst, helping to forge more interdisciplinary efforts between basic scientists and clinicians in particular areas of emphasis — areas where we already show a great deal of strength. We will also be stepping up our collaborative activities with other campuses in the UMass system."

From Concept to Commerce

Working closely with Dr. Bresnick to drum up liaisons with industrial partners for funding faculty projects is Joseph F.X. McGuirl, MBA, who came to UMMC in 1994 as its first executive director for commercial ventures and intellectual property.

McGuirl would rather shorten his title to "deal maker." When pressed, however, he describes himself as "an in-house venture capitalist who seeks out new sources of research funding for my investigators. I want to encourage all UMass researchers to see themselves as entrepreneurs. Mine is a missionary effort to educate scientists about intellectual property, technology transfer and commercialization." (*Continued on page 10*)

Just exactly what is technology transfer? Basically, it is the transfer of any invention, technology or expertise to a commercial setting. Adds McGuirl, who before coming to UMass founded seven companies as a general partner for the New Jersey-based HealthCare Investment Corporation, "Scientists often feel they need to have some technology already developed to license it or patent it."

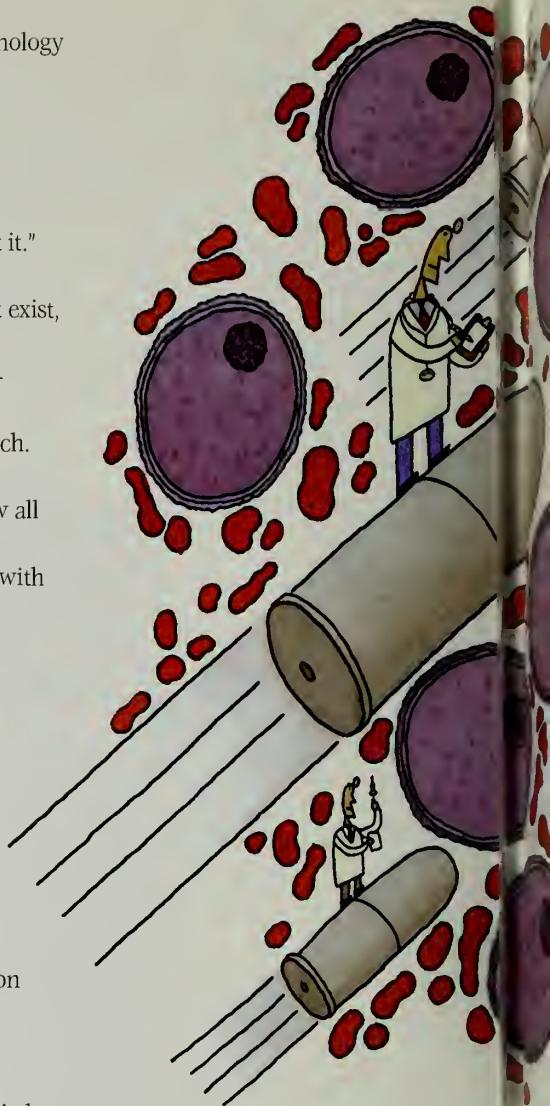
The truth, he says, is that UMass will be able to forge deals on technology that does not yet exist, by establishing collaborations that will result in new technology. And for UMMC, such collaborations create potentially new, corporate sources of revenue that can help to fund still more research.

"I don't want to sit around and wait for inventions to occur," he adds. "I want to get to know all of the investigators so well around here that they'll have to beat me away from their laboratories with a stick. Then I'll go out and talk to the Mercks, Roches and Eli Lillys of the world."

Already, McGuirl has donned the facilitator's hat needed to develop the Center for Advanced Clinical Technology (CACT) at UMass. CACT brings together physicians and researchers able to serve in a "proving ground" role and offers their assistance in development of medical devices, from concept through the FDA approval process. For corporate "clients," it means timesaving as well as the knowledge that their devices undergo careful scientific evaluation by UMMC specialists early in the development stage.

Even before being formalized as CACT, such efforts brought in some \$1 million to the hospital over the last two years. Among recent projects are a "real time" digital mammographic biopsy system, a wound irrigation device and an optical biopsy system.

Eventually, UMass will build its patent portfolio and "increase the deal flow," says McGuirl, "because UMass is an untapped gold mine."





Faces of Research: On the DNA Firing Range

When Harriet Robinson talks about bringing out the big guns to fight disease, she's not kidding: her gun is six feet high and shoots 5,000,000 "bullets" at a time.

What kind of gun is this?

In simplest terms, it is a "DNA gun," and Robinson and her co-researchers are using it to give "DNA vaccines" against viruses. The results may revolutionize the way we protect ourselves against common viruses such as influenza, measles, hepatitis, and even HIV, the virus that causes AIDS. Robinson has met with the Food and Drug Administration to provide initial information on this new technology.

In addition, she is working with UMMC's Office of Research on several licensing agreements.

"There's a big practical component to this research, in the sense that we will be able to make cheap vaccines that produce long-lasting responses," says Robinson. "There is a real potential here for saving lives in my lifetime."

The gun was originally designed to shoot DNA — the genetic blueprint for life — through thick plant cell walls to create transgenic corn, tomatoes, and other crops. Then Robinson's laboratory, in collaboration with scientists at Agracetus Inc., a Wisconsin company, tried vaccinating mice by shooting viral DNA into the skin. The DNA is loaded onto gold beads — gold is heavy and biologically inert — about one micron in diameter. The gun

produces a shock wave that sends the tiny projectiles directly into skin cells, which are 10 times bigger than the beads.

How is a DNA vaccine different from vaccines we now use?

"The chief difference between today's vaccines and the DNA vaccines," notes Robinson, "is that, while conventional vaccines are introduced as proteins that were made outside the body, DNA vaccines make the immunizing protein inside the body's cells. When the gold bullets carrying the viral DNA lodge inside the skin cells, the cells are actually getting instructions for manufacturing the vaccine, just as if the cells had actually been infected by the virus itself."

When a viral protein is produced by a cell, the immune system is triggered into producing virus-fighting responses. Says Robinson: "The most exciting thing about our research is that it's so very simple!"



"The most exciting thing about our research is that it's so very simple!"

HARRIET L. ROBINSON, PHD
Professor of Pathology



Generalist Physician Initiative

The medical school is one of 14 institutions selected to participate in the \$32.7 million, six-year "Generalist Physician Initiative," an ambitious project of the Robert Wood Johnson Foundation aimed at increasing the number of generalist physicians practicing in the U.S. Through the program, UMass plans to increase to 50 percent the proportion of students pursuing generalist physician careers, and increase the number of residency positions in primary care by 25 percent.

Vice Dean for Medical Education

Andrew J. Cohen, MD, associate professor of medicine and physiology, was appointed to the newly-created post of vice dean for medical education. He oversees medical school admissions and student affairs (each with its own associate dean), and directs the Office of Medical Education, which includes programs in curriculum support, educational development and research, and faculty development.

Senior Academic Posts

Deborah Harmon Hines, PhD, associate professor of cell biology and formerly associate dean for student services and minority affairs, was named to the newly-created position of associate provost. Mai-Lan Rogoff, MD, associate professor of psychiatry and pediatrics, and former chair of the Educational Policy Committee, is the new associate dean for student affairs. As associate provost, Dr. Hines is responsible for learning facilities and for student services that affect the medical school and graduate schools of nursing

and biomedical sciences.

As associate dean, Dr. Rogoff is in charge of all programs involving support for medical students. At UMMC, she has directed both the Student Counseling Service and Medical Student Education in Psychiatry, and was associate director of the Psychiatry Residency Training Program.

Japanese Exchange Program

As part of a sister-state relationship promoting friendship and the exchange of ideas, students and professors, UMass Medical School and the Sapporo Medical University in Hokkaido, Japan, announced a faculty exchange program intended to further scientific and research efforts. Each year, two faculty members from both UMMC and Sapporo will spend up to six weeks at the other's institution. The program may grow to include exchanges between students and other health professionals. In 1991, the governors of Massachusetts and Hokkaido pledged to exchange knowledge in the areas of education, science and technology, industry and commerce, tourism, art, culture and sports.

Healthy Schools Program

Five Massachusetts communities receive educational support through a project implemented by UMMC's Area Health Education Center. Titled "Building Healthy Communities through Healthy Schools," it is funded by a \$644,000 grant from the Massachusetts Executive Office of Education. The program trains parents to interact effectively with the school system, and encourages them to become advocates for their children's education. It also links teachers to services for students and their families.

Grant for Worcester Schools

Science education programs in Worcester's public schools will benefit from a grant awarded to UMMC's Office of Science Education. Directed by James Hamos, PhD, assistant professor of cell biology, the \$175,000 award from the Howard Hughes Medical Institute will provide educational opportunities for the more than 5,000 students and 335 teachers in Worcester's North Quadrant schools. In addition, UMass scientists will promote family science in the community, to enable adults to appreciate an inquiry-based (rather than textbook-based) approach to science, enhance their own awareness of modern health and science issues, and encourage them to support a new vision of school-based science activities.

New Department Chairs

Chancellor/Dean Aaron Lazare, MD, appointed Richard V. Aghababian, MD, as chair of emergency medicine; John W. Gittinger Jr., MD, as chair of ophthalmology; Allan S. Jacobson, PhD, as chair of molecular genetics & microbiology; and Charles A. Vacanti, MD, as chair of anesthesiology. Drs. Aghababian and Gittinger had been serving as interim chairs since emergency medicine and ophthalmology were converted from divisions to departments.

■ A member of UMass Medical School's first graduating class (1974), Dr. Aghababian has served on the faculty since 1978. He had been director of the Division of Emergency Medicine since 1983; the Department of Emergency Medicine is New England's first academic base for emergency medicine.

■ Dr. Gittinger joined UMMC as director of ophthalmology in the Department of Surgery, in 1981. He had served on the faculty of Tufts University School of Medicine.

■ Dr. Jacobson, who had served as interim chair of his department since 1991, joined the UMass Worcester faculty in 1973, after completing a postdoctoral fellowship at M.I.T. His research has focused on the cytoplasmic aspects of post-transcriptional regulation in eukaryotes.

■ Dr. Vacanti was recruited from the Massachusetts General Hospital (MGH), where he had served as staff anesthesiologist since 1983. While at MGH, he was an associate in orthopedic surgical research and director of the Laboratory for Tissue Engineering. He also was a research scientist at M.I.T. and Children's Hospital, where he was a staff physician.

PHD Nursing Program

A unique collaboration between the Worcester and Amherst campuses yielded public education's first nursing doctoral program in Massachusetts. A joint venture of Amherst's School of Nursing and Worcester's Graduate School of Nursing, the three-year program is expected to respond to an urgent need for doctorally-prepared nurses in higher education, research, healthcare services and direct patient care.

The Year in Review

SERVICE



New Structure for Clinical Services

In a move to make UMMC more competitive in a rapidly changing healthcare environment, the Board of Trustees approved two major changes in the organizational structure of clinical services. Appointed to the new position of deputy chancellor of clinical affairs was Arthur Russo, MD, formerly director of clinical services. A Clinical Management Board was created to replace the Hospital Management Board. These changes in governance are expected to expedite the decision-making process related to clinical services, enabling all of UMMC's clinical services to operate as one entity. The new structure includes the hospital; Group Practice Plan; clinical finance; managed care; other clinical entities that UMMC owns, operates or affiliates with; clinical information systems; and clinical systems development.

Bone Marrow Transplant

Cancer patients in Central Massachusetts now have access to a treatment previously available only in Boston and Springfield. The UMass Cancer Center opened a bone marrow transplantation unit, offering treatment for such life-threatening diseases as leukemia, lymphoma, aplastic anemia, testicular cancer, and advanced breast cancer. The nine-bed unit is equipped to provide both stem cell and bone marrow transplantation. Initially approved for autologous (using the patient's own marrow) transplantation, the Cancer Center is now approved for allogeneic bone marrow transplantation, in which the patient receives marrow from a genetically-matched donor.

First-ever Lower Leg Transplant

Instead of losing both legs as a result of an accident, a 42-year-old Methuen truck driver emerged from surgery with one useful leg. A team of UMMC plastic and orthopedic surgeons performed the country's first lower leg transplant, by reconstructing the patient's left leg with the tibial bone, along with tissue, muscles, arteries and skin from the other, irreparably damaged leg. The innovative procedure spared the patient from further surgery and enabled him to regain the use of his left leg in only six months. Traditional reconstructive techniques typically require 12 to 24 months.

Hospital Affiliations

Forging ahead with its plan to build an integrated system of high quality, cost-effective healthcare in Central Massachusetts, UMMC announced affiliations with Harrington Memorial Hospital in Southbridge, Marlborough Hospital, and Day Kimball Hospital in Putnam, Connecticut. These hospitals join UMMC's expanding network, which already included Milford-Whitinsville Regional Hospital, Athol Memorial Hospital, and HealthAlliance (the merger of Burbank Hospital in Fitchburg with Leominster Hospital). The affiliations formalize and build upon ties in teaching, research and clinical services.

Base for Second Helicopter

UMass Life Flight now operates a second helicopter, based in western Massachusetts. Following a one-year trial period that demonstrated the need to expand air medical service, Life Flight earned permanent approval from the state Department of Public Health (DPH) to operate a second helicopter. During its 12 years of operation, Life Flight has received more than 13,200 requests for service and transported more than 8,100 patients. Adding the second helicopter increased patient transports by 26 percent during the trial year.

Hospital Ranking

In a series of reports about the quality of care at Massachusetts hospitals, *The Boston Globe* ranked UMass Hospital as one of the "top five" — together with four Boston teaching hospitals — in its analysis of hospitals with mortality rates at least 30 percent below state averages in specific illness categories. While the *Globe's* methodology was questioned by some hospitals and analysts, the UMass ranking was consistent with a 1992 report by the federal Health Care Financing Administration, which placed UMass on a national list of hospitals with lower-than-expected death rates.

The Year in Review

R ESEARCH



Research Appointments

Chancellor/Dean Aaron Lazare, MD, named Edward Bresnick, PhD, as the first vice chancellor for research, and Joseph F.X. McGuirl, MBA, as executive director for commercial ventures and intellectual property (see pages 6, 9). Bresnick, former director of the Norris Cotton Cancer Center at Dartmouth Hitchcock Medical Center, has assumed overall responsibility for scientific program and facilities development. In addition to his responsibilities at UMMC, Bresnick recently became president of the prestigious American Association for Cancer Research. McGuirl, who works with Bresnick on activities to commercialize intellectual property, came to UMMC from ScripTech Pharmaceuticals Inc., where he was vice president of business development.

\$7.8 Million for New Institute

The Weld Administration announced its plans to build a \$7.8 million neuropsychiatry research institute at UMMC. The mission of the institute will be to discover through basic and clinical research the causes and treatment of serious mental illness, ranging from schizophrenia and manic depressive illness, to violent behavior in the mentally ill. A joint venture between UMMC and the state's Department of Mental Health, the new 25,000-square-foot facility will be located on or adjacent to the campus.

Major Women's Health Study

UMMC was awarded a \$10 million contract by the National Institutes of Health to take part in the nation's first-ever major multi-center research study on women's health. UMass will collaborate with the Fallon Healthcare System to form the state's only site outside of Boston

selected to participate in a study that will examine more than 160,000 post-menopausal women nationwide over the course of a decade. The "Women's Health Initiative," which originates from NIH's Office of Women's Health, will study ways to prevent the major causes of illness and death in post-menopausal women: heart disease, cancer and osteoporosis.

Focus on Skeletal Disease

Researchers have long puzzled over how a cell selectively uses parts (genes) of the DNA to perform its specialized function. A group of UMass researchers has been studying the problem, specifically as it relates to osteoporosis and osteosarcoma (bone cancer). In recognition of their path-breaking work in bone cell growth and development, Gary Stein, PhD, professor and chair of cell biology, and Jane Lian, PhD, professor of cell biology, have received a four-year, \$4 million grant from the National Institute of Arthritis and Musculoskeletal and Skin Diseases. Stein and Lian's team has provided new insights into the organization of genes within cells in normal bone and in skeletal disease.

NCI Mammogram Usage Study

The National Cancer Institute awarded UMMC a \$3 million grant to identify the barriers faced by a population of women over 50 who don't get regular mammograms, and to test how to increase screening among these women. By comparing different counseling interventions, the study seeks to uncover the reasons for failure to get mammograms — such as financial or language barriers — and provide resources that will motivate women to seek regular breast cancer screening. Mary Costanza, MD, professor of medicine, is principal investigator for the study.

Markey Grant for Crystallography

A \$1.5 million grant from the Lucille P. Markey Charitable Trust will establish one of the premier x-ray crystallography centers in the state and the only one outside of Boston. Awarded to scientists in UMMC's Program in Molecular Medicine (PMM), the grant will allow the PMM to recruit additional personnel to perform x-ray crystallography, a technique that allows researchers to "see" all of the nooks and crannies of a molecule by freezing that molecule in large amounts and then exposing it to x-rays that cast diffracted patterns on a surface.

\$3 Million Dengue Virus Grant

Dengue fever, a life-threatening virus prevalent in southeast Asia, is the focus of a research study funded by a \$3 million grant from the National Institutes of Health. Headed by Francis A. Ennis, MD, director of infectious diseases and immunology, a team of UMMC researchers is collaborating with colleagues at Yale and in Bangkok. According to the World Health Organization, there are 100 million dengue infections annually.

Gene Therapy Research

UMMC became the first in New England to win government approval to conduct gene therapy research on human subjects. The basic premise of gene therapy is to replace a defective gene with a normal one. The cutting-edge treatment holds promise for sufferers of genetic diseases such as cystic fibrosis or sickle cell anemia. It may also help bone marrow transplant patients by adding genes that protect healthy cells against the debilitating effects of chemotherapy. Trials are expected to begin in 1995, when the Cancer Center's link laboratories are operational (see page 3).

Toward 'Information Highway'

UMMC was chosen as a partner for the \$10.5 million National Academic Medical Center Information Consortium (NAMCIC). The consortium will develop a national medical information repository to be used for collaborative technology assessment, medical research, clinical trials, and to compare and contrast clinical practices across the country. The project is being implemented by the \$70 million, five-year healthcare affairs program of the Advanced Research Programs Agency/Technology Reinvestment Project (TRP). With a \$1.5 million share in the program, UMMC is the only medical center in New England to participate in NAMCIC, and one of only five nationwide. The TRP is a key part of President Clinton's Defense Reinvestment and Conversion Initiative, which emphasizes investments in dual-use technology for both commercial and military applications.

The Year In Review



Richard V. Aghababian, MD,

professor of medicine and chair of emergency medicine, was elected president of the board of directors for the American College of Emergency Physicians. The College represents over 17,000 physicians who specialize in emergency medicine.

Paul S. Appelbaum, MD, professor and chair of psychiatry, was elected president of the American Academy of Psychiatry and the Law. The AAPL is the nation's largest organization of forensic psychiatrists, with more than 1,500 members. His one-year term will begin in October 1995.

Neil R. Blacklow, MD, Richard M. Haidack Distinguished Professor and chair of medicine, was elected to membership in the Association of American Physicians. He is only the second faculty member in the history of UMass elected to the prestigious organization, joining Lewis Braverman, MD.

Lewis E. Braverman, MD, chair of nuclear medicine and director of endocrinology & metabolism, received the Berthold Award, the highest given by the German Endocrinological Society.

Mary E. Costanza, MD, professor of medicine, was elected president of the Massachusetts Chapter of the American Cancer Society, effective June 1995. Dr. Costanza currently serves as vice president of the chapter.

David A. Drachman, MD, professor and chair of neurology, is the new president of the American Neurological Association.

Michael R. Green, MD, PhD, professor of biochemistry & molecular biology, was one of 44 new investigators selected by the Howard Hughes Institute from a field of 285 nominees nationwide. Dr. Green will continue his research

at UMMC on the regulation of cellular and viral genes, with his lab and research team receiving partial funding from the Institute.

Thomas Greenough, MD, assistant professor of pediatrics and medicine in the division of pediatric immunology & rheumatology, received the Henry Christian Award for Excellence in Research from the American Federation for Clinical Research.

Guido Majno, MD, professor and chair of pathology, received the Distinguished Teacher Award from the Alpha Omega Alpha Society and the Association of American Medical Colleges.

Jane G. Zapka, ScD, professor of preventive & behavioral medicine and associate director for cancer prevention and control in UMMC's Cancer Center, was named to the Committee on Research for the National Cancer Institute of Canada. The committee proposes priorities and new initiatives in basic, clinical and prevention research and provides advice on policy and funding. She is one of only two scientists in the U.S. to be awarded this honor.

Ten UMass physicians were named in *The Best Doctors in America*, a directory listing only 2 percent of the practicing physicians in the U.S. The book includes the following full-time faculty:

Paul S. Appelbaum, MD, psychiatry; Lewis E. Braverman, MD, endocrinology; David A. Chad, MD, neurology; David A. Drachman, MD, neurology; John W. Gittinger Jr, MD, ophthalmology; Jeffrey A. Leppo, MD, cardiovascular medicine; Molly R. Schwenn, MD, pediatric hematology/oncology; John L. Sullivan, MD, pediatric immunology; Robert B. Zurier, MD, rheumatology; Robert G. Zwerdling, MD, pediatric pulmonology.

The Year in Review

S potlights



In Praise of Books

Books written by two faculty members caught the attention of the American Medical Writers Association (AMWA), which ranked *Hannah's Heirs: The Quest for the Genetic Origins of Alzheimer's Disease and Itch: Mechanisms and Management of Pruritus* among the top medical books published this year. Authored by Daniel Pollen, MD, professor of neurology and physiology, *Hannah's Heirs* received the "Will Solimene award for excellence in recognition of outstanding quality" as well as first place for "Distinction in Medical Communication," both from AMWA's New England Chapter. *Itch*, by Jeffrey D. Bernhard, MD, professor of medicine and director of dermatology, is the first comprehensive textbook on the subject and received an honorable mention at AMWA's national awards competition.

Young Leader

The Greater Worcester Jaycees named Gladys Rodriguez-Parker one of Worcester's "Outstanding Young Leaders" for 1994. The awards honor men and women who have made contributions to their community beyond the scope of their employment. Rodriguez-Parker is director of outreach programs at UMMC.

Department Founder

Lillian R. Goodman, PhD, dean of the Graduate School of Nursing, was honored by Worcester State College as founder of its Department of Nursing, which observed its 20th anniversary in 1994 and established a scholarship fund in her name.

Employees of the Month

"Employees of the Month" for 1994 were: Ernest Lajoie, carpenter, City Campus; Patricia O'Neil, Pediatric Administration; Janine Turano, Outpatient Registration; Margaret Johnson, Human Resources; Bob Spicer, RN, Critical Care Float Pool; Valerie Buffone, Public Sector Psychiatry; Mary Rizk, Group Practice Plan; Janet Solomon, RN, Comprehensive Breast Center; Russell Mattson, Environmental Health and Safety; Norman Swedberg, Environmental Building Services; Angela Nardella, Hospital Laboratories; and Sandra Campbell, Family & Community Medicine Clinic. Aimed at keeping employee morale high, UMMC's Employee of the Month program identifies and recognizes individuals nominated for demonstrating exceptional performance and dedication to patient care and staff relations.

Facts and Figures

EY 94 Funding and Revenue

Funding and Revenue	
State appropriation* for schools (5.2 percent)	\$25 million
Group practice	\$102 million
Hospital	\$259 million
State contracts**	\$13 million
Research (sponsored activity)	\$61 million
Self-supporting activities***	\$19 million
TOTAL	\$479 million

* The hospital receives no state appropriation.

** Supports public service activity, including provision of mental health and pediatric services for those who cannot afford private care.

*** Examples are parking trust fund, continuing education, financial aid and student fees.

Research Funding

(includes sponsored activity – federal and private grants, contracts and overhead)



Education (1994-95 figures)

Medical School

MD students	423
MD/PhD students	11
Alumni	1,736
Residents & fellows in UMMC programs	486

Graduate School of Biomedical Sciences

PhD students	111
Alumni	82

Graduate School of Nursing

MS students	69
Post-master's students	6
PhD students	5
Alumni	220

Continuing Education

Registrants (estimate) 7,400

Allied Health Program

Students (1993-94) 601

FY 95 Projected Funding and Revenue

State appropriation* for schools (4.8 percent)	\$25 million
Group practice	\$111 million
Hospital	\$264 million
State contracts**	\$16 million
Research (sponsored activity)	\$61 million
Self-supporting activities***	\$19 million
TOTAL	\$496 million



Patient Services FY 94

Number of beds	388*
Number of patients admitted	15,952
Occupancy	79.2%
Average length of stay	7.0 days

Annual surgical cases

Inpatient	7,987
Outpatient	5,746
Outpatient clinic visits	306,738
(excluding ancillary, emergency, Tri-River and day surgery visits)	
Emergency Department visits	47,960
Visits to Tri-River Family Health Center	45,230
(UMMC's satellite in Uxbridge)	
Life Flight missions	1,191
Trauma admissions	1,621

*includes 45 Worcester State Hospital beds under UMMC contract

The Year in Philanthropy

The University of Massachusetts Medical Center received \$3,361,390 in charitable support from individuals, corporations and foundations during fiscal year 1994. This represents an increase nearly two and a half times that of gifts and pledges received in 1993. Individual donors, alumni and patients contributed nearly \$650,000 of the total funds received to support clinical, education and research activities.

Major gift highlights include the Santo and Ellen Didonato Endowed Fellowship in Diabetes, a bequest from the Francis Gibree estate for the UMass Medical School Scholarship Fund, and the Joseph H. and Ellen O'Brien Ellinwood Endowed Fellowship in Vascular Surgery. The Edward Budnitz Professor of Cardiovascular Medicine Fund, honoring one of Worcester's first cardiologists, reached its goal of full endowment at \$500,000 with a contribution from the Ellison Foundation of Boston. The Fraternal Order of Eagles, long-time supporters of UMass, donated generously to benefit pediatric AIDS, pediatric cardiology and the Child Life Program. Also, major gifts from the Variety Club of New England and the Will Rogers Memorial Fund were earmarked for the Children's Medical Center.

During 1994, at the direction of Chancellor Aaron Lazare, MD, UMass initiated efforts to build a comprehensive development program to increase unrestricted and restricted charitable support for the Medical Center. The continued support and growth of UMMC friends, like those recognized in this report, will help strengthen the financial foundation of the Medical Center and benefit the communities which it serves.

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Virginia Harwood
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Foundation Marks Year of Planning, Participation

Fiscal year 1994 has been one of planning and forward thinking for the University of Massachusetts Medical Center Foundation Inc. at Worcester.

Under the leadership of President William D. Kelleher Jr., the Foundation engaged in several projects, including the Campaign for the Learning Center. Additionally, the by-laws of the Foundation were amended to allow the board to act more efficiently in achievement of its goal to nurture and promote the progress, excellence and general welfare of the Medical Center and its fund-raising function. The changes provide more flexibility in scheduling meetings, permit timely decision making and empower the directors to elect members at their discretion rather than annually.

During fiscal year 1995, the Foundation will establish various friends programs to serve as bridges between the Medical Center and the community. These groups will be comprised of directors and volunteers who will work with UMMC to achieve greater community participation in the Medical Center's areas of concentration. A "Friends of the Cancer Center" program will be formed as a prototype. Future programs will be devoted to the Children's Medical Center, diabetes research, cardiovascular research, and mental health.

The UMMC Foundation Campaign for the Learning Center, chaired by R. Norman Peters, will have reached its goal ahead of schedule by the end of fiscal year 1995, \$1.1 million of the total \$2 million effort. The Learning Center is an important addition to the physical plant of the Medical Center. It will enable students to take advantage of the latest in educational and research technology as they train to become physicians, biomedical scientists, and nursing leaders. Groundbreaking is scheduled for spring 1995. Foundation directors have been unanimous in their support of the project, contributing generously financially as well as in spirit.

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The Father of Carol Hokan
Jane B. Howland
Mona Estabrook Hyatt
Anna Ianotta
James Ianotta
Henry Jolda
Stewart C. Jordan
Alice M. Joseph
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George O'Hara
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I wish to designate my gift for _____

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Address _____

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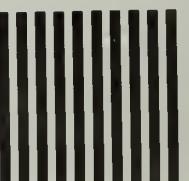
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 Edward Zapp
 The Mother of Raymond Zimov



All Gifts, Great and Small

Hundreds of parents and friends contribute annually to support the UMass Children's Medical Center (CMC), the region's largest inpatient pediatric unit and only pediatric intensive care unit between Boston and Springfield. But one donor stands apart from the rest: Daniel Porcelli, age 15, of Westfield, Mass. For the past year, Daniel has been sending \$10 every month to fulfill a pledge he made to CMC in appreciation of the "excellent care" he received as a patient. Undoubtedly the gift is a great commitment for one teenager, but the amount is exceeded by Daniel's generosity.

Every gift to CMC — great and small — is important. The Medical Center gratefully acknowledges all who responded to the needs of CMC's young patients by contributing to the 1994 Children's Medical Center annual campaign.

Alumni Gifts

In fiscal year 1994, the UMass Alumni Association, family and friends raised more than \$35,000 toward scholarships and loans. These funds are raised annually during the scholarship appeal in December and throughout the year in the form of memorial contributions. More than \$300,000 has been raised in total contributions to date; \$250,000 has been awarded in scholarships and loans.

Medical School Scholarship/Loan Fund

1974
 Leonard M. Finn, MD

1975
 Peter P. Anas, MD
 Jennifer Caskey, MD
 Claudio M. Delise, MD
 Audrey Griesbach, MD
 William B. Holgerson, MD
 Anita Karcz, MD
 Richard P. Moriarty, MD

1976
 Elizabeth C. Brackett, MD
 Thomas M. Fabian, MD
 Frances M. Hinteregger, MD
 Bruce G. Karlin, MD
 Robert G. Lee, MD

1977
 Lorraine K. Bello, MD
 Lena E. Dohlman-Gerhart, MD
 Errol D. Green, MD
 Douglas M. Heuman, MD
 William A. Hilshey, MD
 Stephen D. Kerzner, MD
 Robert B. Leone, MD
 Evelyn S. Love, MD
 Kenneth J. Miller, MD
 Jeffrey R. Penn, MD
 Gordon M. Saperia, MD
 Mary M. Tse, MD

1978
 Rachel A. Bergeson, MD
 George W. Burke III, MD
 Robert B. Daly, MD
 Edward D. Donovan, MD
 Richard B. Edison, MD
 Madeleine R. Fay, MD
 Julia Mason Feudo, MD

1979
 Mark F. Henry, MD
 Jason C. Kantor, MD
 Morris C. Lainer, MD
 Susanna M. Lee, MD
 Anthony F. Marino, MD
 Betsy L. Moody, MD
 Michael B. Roberts, MD
 Scott D. Rowley, MD
 Gail F. Stanton, MD

1980
 Anne Marie Arey, MD
 Albert A. Barrows, MD
 Alan S. Burstein, MD
 Theresa M. Caputo, MD
 Carl S. Ciak, MD
 Richard C. Dicker, MD, MSc
 Nancy L. Feldman, MD
 William X. Fischer, MD
 Brent P. Fletcher, MD
 Neil H. Goldstein, MD
 Irvin N. Heifetz, MD
 Richard P. Jacobs, MD
 Paul S. Kim, MD
 Michael A. Kosmo, MD
 Douglas S. Levine, MD
 Christopher H. Linden, MD
 Kevin N. Mabie, MD
 Andrew J. Miller, MD
 Roger M. Nocera, MD
 Marina Rodriguez, MD
 Carol B. Schreck, MD
 Anne Sigsbee, MD
 Elizabeth J. Spencer, MD
 Alan C. Stefanini, MD
 William M. Sullivan, MD
 Mary E. Weathersby, MD
 Jonathan S. Wolf, MD
 Richard D. Zlotnik, MD

1981
 Lois J. Ayash, MD
 Lawrence F. Brown, MD
 Christopher L. Butler, MD
 William T. Byrt, MD
 Lyne E. Chamuel, MD
 Michael J. Conrad, MD
 Maureen B. Coumas, MD
 James Coumas, MD
 Jon W. Cronin, MD
 Kevin F. DeLacey, MD
 William D. Dillon, MD
 Barry S. Feingold, MD
 Federico Gonzalez, MD
 Barbara M. Healey, MD
 Patricia S. Jay, MD
 Paul A. Keefe, MD
 Lee G. Kendall Jr., MD
 Zamir Nestelbaum, MD
 Kathleen M. O'Grady, MD
 Anthony A. Pellegrino, MD
 Monica M. Przelomski, MD
 Steven D. Salt, MD
 Kathleen A. Trotta, MD
 Julia Yoshida, MD

1982
 Kenneth S. Allen, MD
 Dianne C. Barnard, MD
 Russell B. Bieniek, MD
 Michele B. Bilodeau, MD
 Paul W. Braunstein, MD
 Richard E. Chaisson, MD
 Kevin J. Corbett, MD
 Mark E. Eastham, MD
 Gregory J. Fleming, MD
 Warren Y. Hershman, MD, MPH
 John J. Janeiro, MD
 Peter B. Johnson, MD
 Thomas E. Lawlor, MD
 Robert F. McCarron, MD
 Bruce D. Minsky, MD
 John H. Moye, MD
 Francis R. Murphy, MD
 John B. Pawlowski, MD, PhD
 Susan E. Rosen, MD
 Kenneth Rosenfeld, MD

1983
 Diana L. Schott, MD
 Scott Schroeder, MD
 Margo A. Smith, MD
 Vincent K. H. Tam, MD
 Nicholas M. Tsanotelis, MD

1984
 William J. Callahan, MD
 Paul R. Conlin, MD
 William F. Corbett, MD
 Kevin B. Keating, MD
 Jane A. Lochrie, MD
 Rosemary A. O'Connell, MD
 Andrew A. Proos, MD
 Richard Rogers, MD
 Wayne R. Sharaf, MD
 Jay S. Stiller, MD

1985
 Lori E. Circeo, MD
 Kathleen M. Cleary, MD
 Donna R. Cooper, MD
 Jay M. Daly, MD
 Nancy M. Fontneau, MD
 Anita M. Grassi, MD
 Pamela A. Lippert, MD
 Mary B. Muse, MD
 Richard F. Pebler, MD
 Jean R. Phalen, MD
 Elana L. Rudavsky, MD
 Stephen J. Ryzewicz, MD
 Mary E. Scannell, MD
 Leslie P. Shaff, MD
 Steven M. Shulman, MD
 Mary Sviklas Tanzer, MD
 Philip J. Therrien, MD
 Elizabeth L. Zentz, MD



Building A Legacy of Giving

The Joseph H. and Ellen O'Brien Ellinwood Endowed Fellowship in Vascular Surgery was established this year with an initial contribution of \$238,230. Longtime supporters of UMass, Mr. and Mrs. Ellinwood, residents of Phillipston, created a lectureship in vascular surgery in 1989. Their contributions to medical education have helped to further the understanding and treatment of vascular disease. The Ellinwoods, pictured here with Bruce Cutler, MD, chair, Division of Vascular Surgery, accept a commemorative plaque recognizing the newly established fellowship.

22

1986

Lynn A. Baden, MD
Kenneth P. Colmer, MD
Anne E. Cosgrove, MD
Abraham Fischer, MD
Mark A. Goldberg, MD
Harry W. Grimmelitz Jr., MD
Ellen L. Lee, MD
Michael G. Lerman, MD
Julia Matthews-Bellinger, MD, PhD
Nancy C. Nitenson, MD
Krista E. Patton, MD
Jessica R. Rubinstein, MD
Daniel J. Sullivan II, MD
Jennifer G. Wyman, MD
Aaron L. Zuckerberg, MD

1987

Elias Arbid, MD
Leera M. Briceno, MD
Gary Bubly, MD
Daniel J. Burke, MD
Antoine Fermeini, MD
S. Honor Fullerton, MD
Martha L. Gallagher, MD
Charles S. Hemenway, MD
Shipen Li, MD
Jaisri Lingappa, MD
Donald G. Love, MD
Richard K. McNally, MD
Arlene A. Rozzelle, MD
Michael H. Sisitsky, MD
Marjorie Stock, MD

1988

Philip Ayvazian, MD
Manuel L. Fontes, MD
Richard M. Forster, MD
David C. Henderson, MD
Jonathan G. Jaques, MD

Kimberlee A. Kusiak, MD
Michael S. MacVeigh, MD
Lisa M. Rembetsky-Brown, MD
Michelle Z. Schultz, MD
Howard Snapper, MD
Mary Jean Stempien, MD
Joseph Brian Sullivan, MD

1989

Susan E. Bonadonna, MD
James W. Carroll, MD
Sheira Freedman, MD
Andrea J. Fribush, MD
Patrice F. McIver, MD
Thomas J. Regan, MD
Mary A. Valliere, MD

1990

Michael W. Kruczak, MD
Kathleen H. Leistikow, MD
Jeanne M. Mase, MD
Jeffrey B. Minkovitz, MD
Luan M. Nghiem, MD
David W. Parker, MD
Michele C. Parker, MD
Mark B. Richard, MD
Mark R. Young, MD

1991

Stephen J. Barr, MD
Kyle R. Byrne, MD
Matthew E. Cohen, MD
Joshua P. Cole, MD
A. Patrick Egan, MD
Roger C. Lafleur, MD
Diane C. Lockhart, MD
Susan N. Mahoney, MD
Timothy S. Naimi, MD, MPH
Elizabeth A. Rafferty, MD
Brian P. Sutton, MD

1992

Laura Chen, MD
Michael D'Alessandro, MD
Gina E. D'Ottavio, MD
Dina A. Eliopoulos, MD
Christine A. Hennigan, MD
Anita L. Kostecki, MD
Bonnie Faulkner Ryan, MD
Lanu V. Stoddart, MD
Anne N. Thorndike, MD

1993

Eric J. Alper, MD
Craig S. Cornwall, MD
Christine A. Farrell, MD
Maureen M. O'Brien, MD
Valerie R. Price, MD

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Susan Auerbach, MD '83
Ronald A. Beaulieu, MD '83
William H. Browne
Janet M. Burns
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Arthur M. Christopher
Libby Cone, MD '84
Mr. & Mrs. Charles G. Connors
William F. Corbett, MD '83
Paula A. Dennett
Mrs. Robert S. Dickey
Mr. & Mrs. Charles M. Evans
Deborah A. Ford, MD '83
Mr. & Mrs. Robert S. Foshay
Mr. & Mrs. George E. Funk
Jerry H. Gurwitz, MD '83
Nancy E. Hannigan

Karen B. Harvey-Wilkes, MD '83
Mark A. Jackowitz, MD '83
Kevin B. Keating, MD '83
Paul W. Keough, MD '83
Lorraine Keworkian
Bernadette M. Leber, MD '83
Carol F. Lippa, MD '83
Robert L. Lippa, MD '83
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Elaine F. Mehigan
Katherine A. Miller
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Margaret M. Morgan
Bonnie J. Moulton

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Judith Nelson
Rosemary A. O'Connell, MD '83
John E. Olson
Angelyn Piazza
Helen D. Poole

Andrew A. Proos, MD '83
Marguerite Rafuse
Marilyn L. Risser

Sandra B. Ross

Jane L. Sayre

Robert E. Sheedy

Martha A. Stone

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Mr. & Mrs. Robert L. White

Mitchell Zager, MD

In memory of Riva Grace

Mr. & Mrs. Creighton Gabel

In memory of Elizabeth Thomas, MD '85

Laura Scoville, MD '85

In memory of Paul Vernaglia Jr., MD '78

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Thomas Doherty
Mr. & Mrs. Bruce K. Fuhrmann
Michael T. Leahy, MD '80
Martha Mucci
Marietta Stein
Anna Vernaglia*
Marie Theresa Tomeo
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Barbara Drowne, MS '93, RN
Janice Fitzgerald, MS '93, RN
Paula Goldman, MS '88, RN
Elizabeth Goodwin, MS '92, RN
Carol Haran, MS '91, RN
Anne Marie Kaune, MS '92, RN
Maureen Metters, MS '89, RN
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Beverly Trenholm, MS '92, RN
Barbara Tuthill, MS '87, RN

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Jodi Lane, MS '89, RN
Debra Lundquist, MS '93
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Stephen F. Markus, MD '93
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Bernard J. Roth, MD '85
Mary L. St. Andre, MD '77
Elizabeth Steiner, MD '91
Paul Sullivan, MS '88, RN
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Gary Winzelberg, MD '74*

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Linda Goudey, MD '83
Richard J. Waite, MD '83
Geoffrey & Jennifer Kendall
Lee G. Kendall Jr., MD '81
Joseph Finkle, MD '81
Tatiana I. Lingos, MD '81

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Michael P. Czech, PhD, Director

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One of five UMass campuses, UMMC is the state's only academic health center outside Boston. It includes an advanced tertiary care hospital and its clinics, the state's medical school, graduate schools of biomedical sciences and nursing, a program in molecular medicine and a cancer center. The annual report is published by the Office of Public Affairs & Publications for members and friends of the UMMC community. Paid for out of non-state funds.

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is firmly committed to its policy of equal
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takes active measures against acts of discrimination,
harassment and intolerance.

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